National Public Safety Telecommunications Council

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554



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| In the Matter of | ) | |
| | ) | |
| The Development of Operational, | ) | |
| Technical and Spectrum Requirements | ) | WT Docket 96-86 |
| For Meeting Federal, State and Local) | | |
| Public Safety Agency Communication | ) | |
| Requirements Through the Year 2010 | ) | |
| | ) | |
| Establishment of Rules and Requirements | ) | |
| For Priority Access Service | ) | |

# COMMENTS
of the
NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

National Public Safety Telecommunications Council
2050 East Iliff Avenue
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## I. EXECUTIVE SUMMARY

The National Public Safety Telecommunications Council herein referred to as "NPSTC" intends, by these comments, to make recommendations to the Commission regarding the proposed allocation of 24 MHz of spectrum in the 746MHz to 806MHz band to public safety. It is the intent of NPSTC to further the recommendations of the PSWAC Final Report and to provide a united voice through the representation of its member agencies and organizations. The Commission should be commended for its swift action in proposing to allocate this 24MHz of spectrum to public safety by the mandated deadlines. This is the largest allocation of spectrum ever proposed for public safety and will require a herculean effort on the part of the entities ultimately tasked with managing this process. This filing contains numerous references to and quotes from the PSWAC Final Report submitted to the Federal Communications Commission and the National Telecommunications and Information Administration on September 11, 1996. The PSWAC Final Report has received significant review, support and acceptance within the public safety community, and more importantly by the Commission and Congress. It is important to note that many of the members of NPSTC responsible for the preparation of these comments were active participants in the preparation of the PSWAC Final Report and its five appendices. NPSTC seeks to bring to fruition the recommendations that the public safety community collectively developed in this Advisory Committee process:

> *The establishment of the Public Safety Wireless Advisory Committee provided an unprecedented opportunity for the Public Safety community to recommend changes*

*on a national basis to improve the methods of allocation and administration of radio spectrum for Public Safety support*[1].

The Commission has made several assumptions based upon the PSWAC Final Report that require clarification so that the intention of those critical recommendations is not misinterpreted. The first assumption that requires clarification is that the allocation of this spectrum to public safety will significantly satisfy the recommendations of PSWAC as they pertain to "interoperability" and "new spectrum". The Commission has taken a position that this allocation of new spectrum will satisfy many of the interoperability recommendations of PSWAC. However, it was not PSWAC's intention that 2.5MHz of spectrum requested for interoperability between 138 and 512 MHz was to be provided from new spectrum above 512 MHz. The 2.5MHz requested was to support embedded base needs for interoperability in the existing public safety bands at VHF highband and UHF. This proposed allocation is essentially a new band above 512 MHz and cannot satisfy any requirement for interoperability within the existing VHF or UHF bands. In NPSTC's proposed channel plan contained herein, a sufficient amount of spectrum is set aside for interoperability within the new spectrum allocation. It is NPSTC's position that this 24MHz of spectrum is intended to satisfy the PSWAC recommendation for an immediate allocation of 25MHz of new public safety spectrum, which was separate from the request for 2.5 MHz of interoperability allocations. NPSTC strongly recommends that the Commission establish nationwide interoperability channels within this band.

[1] PSWAC Final Report Vol.1, 2.1, page 17

The proposed allocation of spectrum in 746-806 MHz creates an entirely new band with new interoperability requirements. The embedded base of installed subscriber equipment will not talk below 806 MHz. That equipment will not likely be replaced before its normal replacement cycle, typically 10 to 15 years for portable and mobile equipment. It is expected that equipment manufactured for the new spectrum will be designed to operate throughout the entire public safety frequency range of 764 to 869MHz. NPSTC further clarifies this position in the comments portion of this document.

Another assumption which requires clarification pertains to the funding of the planning process. As the Commission is aware, the process was entirely funded by participating public safety agencies and/or the communications professionals employed by these agencies. The preparation and administration of these plans is done in addition to their normal duties as public safety communications managers. Additional funding beyond what is recommended in the NPRM will be required. The Committees will require computer software and hardware to the support the allocation of frequencies in addition to some level of full time staffing for at least the first few years of the process. The present process made up of volunteer staff, cannot support a process so complex.

The NPSTC member organizations still find confusion in the Commission's discussions of interoperability and mutual aid. As such supports the Commission's proposal in paragraph 32 of the Notice to adopt the PSWAC definitions. As was noted in NPSTCs comments in response to ET Docket 97-157, interoperability is the ability of units to be able to intercommunicate as a result of the commonality of channels and technical standards. This applies to mutual aid communications,

where dissimilar equipment is encountered. Therefore, interoperability is a technical criteria, in addition to being an operational criteria.

Mutual aid is the ability of units from different agencies to provide assistance for routine interagency communications and major incidents or catastrophes. This is an operational criteria, which requires the technical capability of interoperability. In a typical situation, Mutual Aid may be regarded as a horizontal interface among agencies of similar disciplines. This type of Mutual aid can be simply illustrated as two fire companies from different jurisdictions assisting each other at a common incident. Operationally, interoperability may be regarded as a vertical interface between agencies of dissimilar disciplines. Interoperability can be simply illustrated as a fire company and a police agency working together during a major incident where the two groups work together for a common goal.

NPSTC supports the establishment of a National Plan with an improved and updated form of planning committees. It is our opinion that the plan must be implemented and administered through an equitable process to ensure that all public safety entities are represented. The National Plan should establish the structure of the planning committees and their administrative responsibilities. This plan should define certain aspects of the channelization scheme to ensure spectrum efficient channel usage, and provide a framework, with enforcement, for the return of channels. It must also provide for a common database platform to maintain the operational specifics of each licensee within the new spectrum. The planning committees must have representational membership from each of

the Public Safety radio services to provide the wide range of input necessary for an effective review process.

NPSTC recommends that the Commission mandate receiver standards for use throughout the entire new allocation. Mandatory standards will ensure that the new spectrum will be utilized as efficiently as possible. By mandating standards the planning committees can allocate channels based upon sound engineering principles in order to effectively and efficiently assign the new spectrum. NPSTC further recommends the issue of receiver standards be the subject of a Further Notice of Proposed Rulemaking.

NPSTC urges the Commission to adopt the definitions of public safety as defined in the PSWAC Final Report. These definitions were developed by public safety personnel under the auspices of the Public Safety Wireless Advisory Committee. This recommendation is further discussed in paragraph 38 of this document.

The Commission supports trunking as a standard for interoperability channels. NPSTC strongly disagrees with this position for several reasons. The foremost reason for our position is the inherent cost and complexity of trunked systems. Since the majority of interoperability communications is conducted in the tactical mode there is no benefit to mandating trunking for interoperability channels. Additionally, the complexity of maintaining the infrastructure with regard to talkgroups and the ID database adds an additional burden to trunking system managers. For these reasons and others detailed in our response to paragraph 101 of the Notice , NPSTC cannot support the

Commission's position. As such, NPSTC formally recommends the adoption of 12.5 kHz (11K3F3E FDMA) as the analog baseline for interoperability and further recommends that the Commission adopt the Project 25 Phase I (12.5 kHz FDMA) common air interface as the digital baseline for interoperability for this new band. Additionally, NPSTC recommends that the Commission require that this baseline be included in all digital subscriber equipment in addition to any other digital operating modes that might appear be present in the subscriber unit.

This is a significant milestone in the Commission's effort to satisfy the requirements of the PSWAC Final Report. The Commission should continue these efforts and ensure that the public safety community continues to participate in this process. Public Safety has always shown a strong commitment to the Commission's efforts to utilize our spectrum resources as efficiently as possible within technical boundaries. NPSTC, representing a broad spectrum of public safety, wishes to further the PSWAC effort to its fruition.

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## II. INTRODUCTION

The National Public Safety Telecommunications Council (NPSTC) is a federation of associations representing Public Safety telecommunications. It was formed May 1, 1997 during its charter meeting in Washington, D.C. NPSTC charter organizations include:

American Association of State Highway Transportation Officials (AASHTO)
Association of Public-Safety Communications Officials -International (APCO)
Forestry Conservation Communications Association (FCCA)
International Association of Chiefs of Police (IACP)
International Association of Fire Chiefs (IAFC)
International Association of Fish and Wildlife Agencies (IAFWA)
International Municipal Signal Association (IMSA)
National Association of State Emergency Medical Services Directors (NASEMSD)
National Association of State Foresters (NASF)
National Association of State Telecommunications Directors (NASTD)
National Coordinating Council for Emergency Management (NCCEM)
U.S. Department of Agriculture (US DoA)

NPSTC was created to encourage and facilitate the implementation of the findings and recommendations of the Public Safety Wireless Advisory Committee (PSWAC) - a federal advisory committee jointly established to advise the Federal Communications Commission (Commission) and the National Telecommunications and Information Administration (NTIA). Specifically, the NPSTC charter directs that NPSTC shall develop and make recommendations to appropriate governmental bodies regarding Public Safety communications issues; shall serve as a standing forum for the exchange of ideas and information regarding Public Safety communications; shall develop recommendations regarding Public Safety communications policies that promote greater interoperability and cooperation between federal, state and local Public Safety agencies; shall identify and promote methods for funding development of Public Safety communications systems; shall sponsor and conduct studies of Public Safety communications and; shall perform such other functions as the Governing Board deems appropriate, consistent with relevant law. Pursuant to the mandate of its charter, NPSTC is pleased to submit these comments in this proceeding.

## III. INTEROPERABILITY SERVICE RULES

1. In paragraphs 29-32 of the Notice, the Commission discusses definitions critical to appropriate implementation of interoperability. NPSTC represents many of the same organizations and individuals involved in the PSWAC process. **As such, NPSTC supports the Commissions proposal in paragraph 32 to adopt those PSWAC definitions**. In the PSWAC Final report, page 44 at section 4.3.2:

> *In its deliberations, the Interoperability Subcommittee and ultimately the Steering Committee adopted the following formal definitions of Public Safety, Public Service, Interoperability, and Mission Critical.*

The definitions for Public Safety and Public Service are provided in paragraph 38 herein.

2. The PSWAC Final Report recommends an analog baseline for interoperability. NPSTC agrees with this recommendation for the many reasons detailed in the PSWAC Report. **NPSTC formally recommends the adoption of 12.5 kHz (11K3F3E) FDMA as the analog baseline for interoperability.**

3. If we are to encourage the use of this band for interoperability by users who do not build entire systems within this new band, equipment must be affordable. This is particularly important for Public Service Providers who we propose to be authorized to use this new band for coordination purposes. While equipment incorporating digital modulation is being rapidly introduced into the public safety band at all levels of government, there will be a cost penalty for digital equipment until there is a significant base of installed equipment. However, NPSTC believes that, because digital equipment is now available from a number of manufacturers, and offers

significant advantages over its analog counterpart, many agencies building new systems in this band will employ digital equipment. It is therefore imperative that the Commission, as part of this proceeding, adopt a digital baseline standard for interoperability.

4. Furthermore, PSWAC recognized the importance of infrastructure-based solutions to provide interoperability between users in different bands. As noted in the PSWAC Report, it is not possible to interconnect digital infrastructures employing dissimilar vocoders, error correction algorithms and framing, and achieve acceptable end-user performance. A consensus of the NPSTC member organizations support adoption of the Project 25 Phase I (12.5 kHz FDMA) common air interface as the digital baseline for interoperability for this new band. **Additionally, NPSTC recommends that the Commission require that this baseline be included in all digital subscriber equipment in addition to any other digital operating modes that might be present in the subscriber unit.** The reasons for this recommendation will be discussed in more detail in our response to paragraphs 104-107 of the Notice.

5. With respect to the Commission's question on whether adoption of a digital standard would result in interoperability equipment being tied to today's digital technology, NPSTC specifically notes that Project 25 is an evolving process. The Project 25 Steering Committee has already adopted a Phase II technology platform for 6.25 kHz bandwidth FDMA equipment and, in January 1998 will begin deliberations on a second Phase II track for TDMA equipment. The Project 25 Steering Committee has stated its belief that 6.25 kHz Phase II equipment will be available well ahead of the Commissions 2005 deadline for type acceptance.

6. The Commission, in paragraphs 33 - 36 of the Notice, discusses the three types of interoperability: mutual aid, task force and day-to-day. NPSTC calls attention to the general confusion that exists between the operational and technical definitions for "interoperability." In paragraphs 33-36, the Commission discusses operational definitions and implementations of interoperability. There is also a technical definition for the term "interoperability" which is used to mean that two or more pieces of equipment are technically capable of communicating with each other. While both are frequently used, one must be careful to not misinterpret the terms. NPSTC agrees with the Commission's statement in paragraph 33 regarding the confusion that exists between the terms "interoperability" and "mutual aid."

7. As was noted in NPSTCs comments in response to ET Docket 97-157, interoperability is the ability of units to be able to intercommunicate as a result of the commonality of channels and technical standards. This applies in mutual aid communications, where dissimilar equipment is encountered. Therefore, interoperability is a technical criteria, in addition to being an operational criteria.

8. Mutual Aid is the ability of units from different agencies to provide assistance for routine interagency communications and in times of major incidents or catastrophe. This is an operational criteria, which requires the technical capability of interoperability. .Mutual Aid channels are uniformly (nationally or regionally) designated channels upon which traffic loads, beyond the capacity of normal operating systems, can be carried, or for communications where a commonality

of channels and technical standards between different agencies' systems does not exist.

9. In the following examples, it has been typical in many cases for agencies of a similar discipline in a region to operate similar technology equipment, i.e., equipment which can interoperate from one agency's units to another's. In this situation, Mutual Aid may be regarded as a horizontal interface among agencies of similar disciplines. This type of Mutual aid can be simply illustrated as two fire companies from different jurisdictions assisting each other at a common incident.

10. The key ingredient is that technical interoperability must exist between the various units trying to communicate. Where systems are different, such as a Motorola Smartzone trunking system and an Ericsson EDACS system, the technical interoperability does not exist. In that case it is necessary to use mutual aid channels upon which equipment operates in a common technical mode.

11. Operationally, interoperability may be regarded as a vertical interface between agencies of dissimilar disciplines. Interoperability can be simply illustrated as a fire company and a police agency working together during a major incident where the two groups work together for a common goal.

12. NPSTC proposes that the Commission use the term "mutual aid" exclusively in the contexts of paragraph 33. The PSWAC Report provides examples of the types of interoperability encountered during response to large scale emergencies and disasters where public safety agencies

from different jurisdictions and disciplines must communicate among themselves and with public service agencies, often with little prior planning. It further recommends that existing references to "mutual aid" in Part 90, such as those noted in footnote 41 on page 16 of the NPRM, be changed to "interoperability" as part of this proceeding.

13. The Commission, in paragraph 34 of the Notice, discusses emergency preparedness and task force operations. NPSTC disagrees with the Commission that "emergency preparedness" should be included in this second context. While the Commission correctly identifies that task forces typically involve agencies from many jurisdictions, they generally involve only a single discipline and almost always involve multiple layers of government (federal, state and/or local). Second, task forces normally operate from existing communications centers or fixed facilities built specifically to support their operations; they rarely deploy emergency operations centers and on-scene command posts, but typically operate from a passenger vehicle or a small passenger van. While task forces may roam throughout a wide area, their wide area communications are generally administrative. NPSTC agrees with the PSWAC ISC's statement that task force operations are characterized as missions which allow for prior planning and that the covert nature of some missions often make long range tactical transmissions undesirable. Probably the most often constituted task forces are for federal/state/local drug interdiction. In contrast, NPSTC notes that emergency preparedness missions usually activate emergency operations centers and often deploy large and sophisticated on-scene command posts to respond to large emergencies and disasters. While some functions during an incident such as the Oklahoma City bombing require secure communications, emergency preparedness communications are not covert. Because the events that generate emergency

preparedness responses are normally unplanned and large scale (such as major fires, earthquakes and hurricanes), emergency preparedness operations should be included in the mutual aid context discussed in this document.

14. The Commission, in paragraph 35 of the Notice, discusses day-to-day operations as the third context for interoperability. We agree with the Commission's discussion and PSWAC comments regarding this third context. NPSTC believes that over 90% of all interoperability requirements support day-to-day operations. Furthermore, with the trend towards more personal, portable-based communications within public safety organizations, NPSTC notes that carrying a second "interoperability radio" such as a radio in this new 746-806 MHz band is not an option. Portable-based interoperability must typically be based within the same radio platform as that used for operational communications.

## IV. INTEROPERABILITY SPECTRUM

15. In paragraphs 37-45, the Commission discusses the location and amount of interoperability spectrum. We agree with the Commission's use of the term "interoperability channels" rather than "mutual aid channels" as discussed above.

16. The Commission, in the paragraph 39 of the Notice, references the 2.5 MHz of spectrum proposed by PSWAC for interoperability. NPSTC notes that the PSWAC ISC proposal for an "interoperability band" was designed to reduce the requirement of many agencies to equip their vehicles with multiple radios. As stated above, this separate interoperability band will not meet the

day-to-day requirements of the rapidly increasing numbers of portable-based users who cannot carry multiple radios. With a large majority of such agencies (including almost all law enforcement in the Los Angeles and New York metropolitan areas, and all federal government agencies) operating in bands below 512 MHz, PSWAC correctly concluded that the 2.5 MHz interoperability band must be located in spectrum below 512 MHz.

17. The Commission, in paragraph 44 of the Notice, concludes that the establishment of nationwide interoperability channels would be in the public interest. **NPSTC strongly recommends that the Commission establish nationwide interoperability channels within this band..**

18. The Commission, in paragraph 45 of the Notice, solicits comments on where this spectrum should be located. As previously noted, NPSTC supports the PSWAC recommendation that 2.5 MHz of spectrum must be allocated for interoperability in bands below 512 MHz. However, we also note the PSWAC statement:" The Steering Committee supports 2.5 MHz of spectrum for interoperability in the VHF and UHF bands between 138 MHz and 512 MHz."[2] To that end, NPSTC has included a number of both simplex channels and mobile relay paired channels in its proposed channel allocation plan included herein as Appendix A.

19. The Commission requested comments as to which bands should be used to provide interoperability and how that spectrum might be cleared. NPSTC notes that several such bands were

[2] PSWAC Final Report Vol.1 page 21, 2.2.1

identified in the PSWAC Final Report, including the "IMTS frequencies" in both the VHF (152-158 MHz) and UHF (453-458 MHz) bands[3]. Beyond those bands, the NPSTC also notes that the Department of Defense has spectrum allocated in the 138-144 MHz bands, which is primarily used on military installations within the continental United States. With a large number of these bases being closed or consolidated, NPSTC believes that consolidation of DoD operations into a portion of this spectrum might be possible, releasing a significant portion of that band for interoperability and operational requirements of agencies operating in bands below 512 MHz.

20. The Commission, in paragraphs 46 - 52 of the Notice, proposes to categorize interoperability communications into 4 types: voice, data, image/high speed data and video. NPSTC generally supports these categories, noting that some of them (such as 12.5 kHz voice and data at gross channel rates >= 6 kbps or 25 kHz voice and data at gross channel rates >=19.2 kbps) can be carried over the same width channel and have historically been intermixed within a common band. NPSTC's channeling proposal in Appendix A considers these general categories of operation.

21. In the context of paragraph 47, NPSTC generally agrees with the Commission's discussion of the types of voice communications in paragraph 47. However, the Commission's comment at the end of that paragraph appears to imply that only communications among field personnel of different agencies (the 4th situation) could involve either direct or repeatered communications. In actuality, all four of the scenarios could involve either of these two modes. The

[3] 47 CFR 22.561 Channels for One-Way or Two-Way Mobile Operation in the Public Land Mobile Service

use of direct (simplex) or repeatered (duplex) communications is usually more dependent on the frequency band being utilized and the frequency congestion in the area of the communications than on the actual type of communications involved.

22. The Commission, in paragraphs 49 and 50 of the Notice, discusses Image/High Speed Data (HSD) and Video Communications. NPSTC agrees with the Commission's statements, noting that recent developments in video compression have made it possible to transmit near real-time digitized video in the narrow bandwidths envisioned for Image/HSD.

23. The Commission, in paragraph 52 of the Notice, specifically requests comments on use of the proposed interoperability channels. Contained herein is a proposed channel plan (See attached Appendix A) which includes interoperability channels for both simplex and duplex voice, high speed data, and digitized video. We do not propose any channels wider than 150 kHz to handle video. NPSTC does not believe there is sufficient spectrum in this new band to justify any wider bandwidths for full-motion video and recommends that the Commission allocate additional spectrum in other higher frequency bands for this specific public safety application in a later rulemaking. In Paragraphs 58 and 59 below we discuss technical advances which will allow the two channel pairs we propose for video-type applications to meet many of the needs for video information.

In Appendix A, we propose:

1. Twenty-four (24) simplex voice/slow speed data channels for tactical on-scene communications:

   - Six (6) frequencies for Public Safety/Public Service shared general use;
   - Eighteen (18) frequencies for Public Safety only use.

2. Two (2) paired wideband digital video channels for transmission of near real-time video and/or image information such as disaster response and damage assessment information from an airborne platform to an EOC or digital video from the camera in an officer's vehicle to area dispatch centers when the "officer-down" button is pressed on the officer's portable radio.

3. Two (2) paired wideband digital data channels for rapid transmission of information such as large files of equipment/supplies from a staging area to an EOC or a file of evacuation shelter residents to a Red Cross facility; we propose that these channels be available for both Public Safety and Public Service Providers.

4. Twenty (20) paired voice/slow speed data channels with use restrictions as follows:

   - Two (2) paired coordination channels available for both Public Safety and Public Service eligibles to be used for wide area coordination and general management of command level activities surrounding an incident;

- Six (6) paired specific use channels, two each for Emergency Medical Services, Fire and Law Enforcement (all for Public Safety eligibles only), to be used for coordination of service specific events such as EMS response to mass casualty incidents, fire coordination of automatic aid responses, or law enforcement pursuits;

- Two (2) paired Public Safety/Public Service shared general access channels for wide area coordination between Public Safety and Public Service Providers, such as coordination between power utility substation operators and an EMS/fire/rescue team at the scene of an incident involving downed electrical service lines;

- Ten (10) paired tactical channels for Public Safety use only to coordinate field operations over a large area such as communications from an ICS Operations division commander to the fire crews in his/her division.

24. The Commission, in paragraphs 58 and 59 of the Notice, discusses the potential use of digitized video. NPSTC proposes that the Commission allow compressed digital video in this band and has proposed two specific channel pairs for such applications (see attached Appendix A). These 150 kHz channels, using the standards referenced in footnote 115 of the NPRM or others now under development, would provide carriage of near real-time video to meet many of the operational requirements discussed in the PSWAC Final Report. NPSTC does not believe there is sufficient

spectrum in this new band to justify any wider bandwidths for full-motion video, and recommends that the Commission allocate additional spectrum in other higher frequency bands for this specific public safety application in a later rulemaking.

## V. TRANSMISSION TECHNOLOGY

25. In footnote #115, the Commission specifically references APCO Project 34. Project 34, with funding from the National Institute of Justice (a US Department of Justice agency), is now beginning the standards development process using a TIA-based structure similar to that used by Project 25. To date, Project 34 has over 19 manufacturers who have expressed interest in participating in the development of the high speed data standards suite.

## VI. CHANNEL SPACING

26. In paragraphs 61 through 64 of the Notice, the Commission discusses channel spacing. Before discussing spacing, the issue of channel width must be resolved. Specifically, in paragraph 63, the Commission discusses the PSWAC recommendation of 16K0F3E as the emission standard for interoperability. The Commission's discussion does not, however, include the final PSWAC ISC discussion on channeling:

> *"Effective January 1, 2005, the minimum baseline technology for interoperability, for unit to-unit voice communication, should be mandated as 11K25F3E (analog FM) in the public safety spectrum between 30 MHz and 512 MHz, unless FCC and/or NTIA regulations stipulate a different emission in a specific operational band. The maximum allowable interoperability bandwidth in any new spectrum allocation should not be allowed to exceed the bandwidth established for operational*

*communications within that new spectrum*[4]."

27. Furthermore, in the context of paragraph 40, the possibility of modifying existing equipment in the 806-864 MHz band to operate in this new spectrum does not appear to be a viable option. Thus, while the PSWAC final report recommended 16K0F3E in existing bands, converting to 11K25F3E(11K3F3E) by January 1, 2005, it specifically recommended that interoperability in any new bands not exceed that for operational communications in that band. **Because voice and slow speed data channelizing is proposed at 12.5 kHz as recommended by PSWAC, there is no need to channelize the interoperability channels at any wider bandwidth.**

28. In paragraph 64 of the Notice, the Commission asks four questions regarding channel spacing. In regard to the first question, Appendix B presents a technical discussion of adjacent channel interference potential with regard to close-spaced use of channels. Based on this discussion, the NPSTC believes that the interoperability mobile relay channels should be assigned in blocks of two adjacent channels with minimum separations of 450 kHz between blocks. With proper designation of the two channels in each block as part of the national planning process, NPSTC believes issues of adjacent channel interference can be resolved. The 24 simplex blocks are proposed for assignment in four blocks of six each. As these are primarily on-scene tactical channels, proper selection of channels at the scene of incidents can be made operationally to similarly minimize adjacent channel interference.

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4 PSWAC Final Report. Appendix C: Interoperability Subcommittee Final Report, Section 1.7, Conclusions and Recommendations, page 17(291); and ISC Work Group Ten 12.10.6 Recommendations, page 210(484).

29. Secondly, the Commission suggests 25 kHz spacing to allow channels in this band to be easily incorporated into equipment in the 806-821 MHz band. As stated above, based upon information from manufacturers, NPSTC does not believe existing equipment can be modified to operate in this new band. However, new equipment can and certainly will be built to operate across the entire 746-869 MHz bands. New equipment will generally be bandwidth agile and can incorporate both 12.5 and 25 kHz bandwidths into the same equipment, being demonstrated in low-cost commercially available land mobile equipment operating today in the 150-512 MHz bands. The Commission further discusses transitioning the 806-821 MHz band to 12.5 kHz. While an admirable goal, NPSTC notes that equipment in use today in this band has a life expectancy of 12-15 years. Beyond that, there are a number of 19.2 kbps data systems built in this spectrum which require the full 25 kHz channel to operate.

30. Next, the Commission asks about spacing for data interoperability channels. It is NPSTC's belief that slow speed data (12.5 kHz bandwidth) and medium speed (25 kHz bandwidth) channels can be used within the standard voice channel spacing, with adjacent channel protection provided through the planning and coordination process. Because high speed data (proposed 150 kHz channel bandwidth) technology has not yet been defined, NPSTC believes it is critical to define a band plan which allows for minimal potential interference to other users. The band plan recommended in Appendix A addresses these issues as follows:

- Adjacent channel coupled power from a wide (150 kHz) channel could theoretically impact a number of adjacent 12.5 kHz channels depending upon the modulation and emission mask